# BTEC Assignment Brief

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| **Qualification** | Pearson BTEC International Level 3 Diploma in Construction and the Built Environment<br>Pearson BTEC International Level 3 Extended Diploma in Construction and the Built Environment<br>Pearson BTEC International Level 3 Diploma in Civil Engineering<br>Pearson BTEC International Level 3 Extended Diploma in Construction and the Civil Engineering |
| **Unit number and title** | **Unit 23: Construction in Civil Engineering** |
| **Learning aim(s)** (For NQF only) | **A:** Understand the methods and techniques used to perform earthwork activities. |
| **Assignment title** | Excavation and Earthworks |
| **Assessor** | |
| **Issue date** | |
| **Hand in deadline** | |

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| **Vocational Scenario or Context** | You have been employed as a trainee site engineer in a local civil engineering section of a large construction company. The team you are working with provides innovative, effective solutions to civil engineering challenges. The company is involved in a wide range of areas such as roads, railway, water and wastewater, highways, energy and bridges. There is a demand for modern infrastructure, which meets the needs of today's society without affecting future generations. |

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| **Task 1** | To help with your development within the company and as part of your training to enhance your knowledge your mentor has asked you to describe the methods and plant which would be used for large excavation work, which would be required for the project detailed below.<br><br>Once you have completed that work, your mentor wants you to appraise and contrast the excavation methods, earthwork support and dewatering systems required for the proposed city waste water system project detailed below.<br><br>PROJECT<br>The existing city sewer network system (the city has a major river running through it and is close to the sea) has the following deficiencies:<br><br>• An aging sewer network of limited capacity, which does not meet the demands of the increasing population.<br>• A combined sewer overflows discharging raw sewage into rivers during periods of high rainfall.<br>• Insufficient capacity to deal with periods of high rainfall leading to localized flooding.<br>• A system Non-Compliant with Current Directives and Legislation |

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| | • Impact on the Environment due to all of the above.<br><br>It is proposed that the following works are required to resolve the situation.<br>• 9 km Tunnel System ranging from 2m diameter tunnel at the start to 4m at the exit point.<br>• 19 No. Shaft Locations<br>• Removal of existing combined sewer overflows (CSOs), which divert raw sewage and storm water during storm events into nearby rivers and sea.<br>• Construction of a pumping station.<br>• Construction of a three-storey service building.<br><br>As a requirement of this works it is proposed that a terminal pumping station be constructed. The pumping station is 30 m deep and 37m in diameter.<br><br>You will produce a report for your mentor as part of your on-going assessment in work to prove your competence.<br>You have been asked to appraise and contrast the excavation methods; earthwork support and dewatering systems required for the proposed project and describe the methods and plant, which could be used for the large excavation work within the project.<br><br>**To do this:**<br>• Research the different methods and plant, which would be used for large excavation work.<br>• Research the earthwork support and dewatering systems required for large-scale excavations.<br>• Appraise and contrast the excavation methods, earthwork support and dewatering systems required for large-scale excavations.<br><br>**You then need to:**<br>Produce an illustrated technical report that appraises and contrasts the excavation methods, earthwork support and dewatering systems required for large-scale excavations and describe the methods and plant which could be used for the large excavation work.<br><br>- Consider all the different earthwork activities, earthmoving and compacting equipment, concreting equipment, temporary works, dewatering operations and piling operations including the benefits and drawbacks of each method. |
| **Checklist of evidence required** | Evidence must include:<br>An illustrated technical report that appraises and contrasts the excavation methods, earthwork support and dewatering systems required for large-scale excavations and describes the methods and plant which would be used for the large excavation work.<br><br>Your report should include evidence of individual research conducted by the learner for example, images and |

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| | explanations of the range of plant and equipment required for the excavations, earthwork support and dewatering systems, case studies of methods and techniques to manage excavations and earthworks. These will be fully annotated and referenced appropriately to support the narrative of the evidence. |

| **Criteria covered by this task:** | |
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| Unit/Criteria reference | To achieve the criteria you must show that you are able to: |
| 23/A.D1 | Evaluate the excavation methods, earthwork support and dewatering systems required for large-scale excavations. |
| 23/A.M1 | Compare the excavation methods, earthwork support and dewatering systems required for large-scale excavations. |
| 23/A.P2 | Describe the earthwork support and dewatering systems required for large-scale excavations. |
| 23/A.P1 | Explain the methods and plant used for large excavations. |

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| **Sources of information to support you with this Assignment** | **Textbooks**<br>S Emmitt and C.A Gorse 2014 “Barry’s Advanced Construction of Buildings” 3rd Edition Published by John Wiley and Sons Ltd ISBN-10: 1856178056<br><br>R Greeno 2012 “Advanced Construction Technology” 5th Edition Published by Pearson ISBN 10: 0435046837<br><br>**Websites**<br><br>The Construction Industry knowledge base: https://www.designingbuildings.co.uk<br><br>Institution of Civil Engineers: https://www.ice.org.uk/<br><br>**Above are examples of websites. Further useful resources may be found at** qualifications.pearson.com/en/support/published-resources.html |
| **Other assessment materials attached to this Assignment Brief** | *N/A* |